US Army Corps of Engineers®
Norfolk District

Pesticide Drum Area

Former Nansemond Ordnance Depot

Fact Sheet

FORMERLY USED DEFENSE SITES (FUDS) PROGRAM

JANUARY 2008

Corps Completes Pesticide Drum Area Proposed Plan

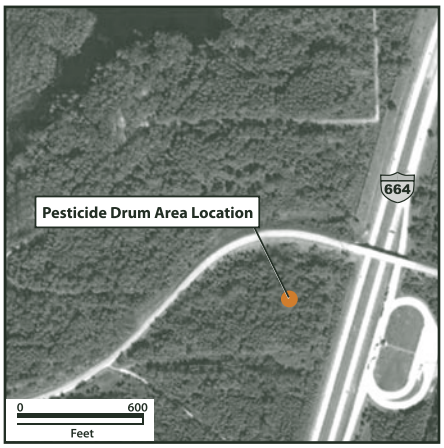
Site History

The **Pesticide Drum Area** is located in the center of the Former Nansemond Ordnance Depot (FNOD) property in the northeast corner of a triangular area bounded by College Drive on the west, Armistead Road to the north, and I-664 to the east. The U.S. Army established the FNOD in 1917 and operated it as an ammunition supply, maintenance, and disposal facility until 1950. The Department of Navy then operated the FNOD from 1950 until 1960. In 1960, the entire FNOD 975-acre parcel was transferred to private ownership. Today, the FNOD land is principally occupied by the Tidewater Community College (TCC) Portsmouth Campus, the General Electric Corporation (GE); Ashley Capital, LLC; Continental Properties; Dominion Lands; and the Hampton Roads Sanitation District; the Virginia Department of Transportation (Interstate 664); City of Suffolk Economic Development Authority; Suffolk Towers LLC; and SYSCO Food Services.

The Pesticide Drum area was discovered by the US Army Corps of Engineers (the Corps) in 1998. This site consisted of two unsealed, unmarked, and abandoned 55-gallon drums located in a wooded area west of I-664. When first discovered, one of the drums was described as being open with no lid and lying on its side. The second drum was covered with a lid containing several small holes. This drum was found resting upright against a small log. In November 1998, two surface soil samples were collected to the southeast of the empty drum.

Pesticide Drum Area before clean up

The results from this soil sampling effort showed that the metal arsenic, and several semi-volatile organic compounds (SVOCs) such as the pesticide dieldrin, and polychlorinated dibenzo –p-dioxins/polychlorinated dibenzofurans (PCDDs/PCDFs) (see glossary, page 4) were present at concentrations above EPA Region III residential risk-based concentrations. The Pesticide Drum area was **not** included in EPA's National Priorities Listing of the former depot in January 1999.



Location of Pesticide Drum Area

Corps Completes Environmental Studies

The Corps has completed environmental investigation activities at the Pesticide Drum area. Results of this investigation indicate that the contaminants in the soil at this site are not present in concentrations that will pose a risk to human health or the environment. Environmental studies at the Pesticide Drum area included soil sampling, a human health risk assessment, and a screening level ecological risk assessment.

Pesticide Drum Area today

Timeline of Work Completed

1998

November 1998 – The Corps collected two surface soil samples to the southeast of the empty drum. The results showed that the metal arsenic, the pesticide dieldrin, and several PCDDs/PCDFs were present at concentrations above EPA Region III risk-based concentrations (RBCs) for residential soil.

1999

May 1999 – The Corps collected two samples of the unknown liquid inside one of the drums. This liquid sample detected four semi-volatile organic compounds (SVOCs) including (2,4-dimethylphenol; 2-methylphenol; and 4-methylphenol, and phenol) and one pesticide (endosulfan sulfate). Different analytes were detected in the 1998 soil samples than what was detected in the liquid sample from inside the drum. Based upon the results from this initial investigation, the Corps agreed to remove the drums and conduct further soil sampling at the site.

2000

November 2000 – The Corps prepared the drums for removal and collected soil and rinsate samples. Neither of the drums contained any liquid. No soil staining was observed in the vicinity of the drums. The rinse samples were analyzed for the Resource Conservation and Recovery Act (RCRA) waste disposal characteristics of ignitability, corrosivity, reactivity, and toxicity. The toxicity analyses consisted of VOCs, SVOCs, pesticides, and metals. The soil sample was analyzed for VOCs, SVOCs, pesticides, PCBs, explosives, metals, and cyanide. The soil sample results were compared to EPA Region III RBCs for residential soil. Dieldrin and arsenic were the only analytes detected above RBCs for residential soil.

2001

February 2001 – The Corps returned to the site to remove the drums. One of the two overpack drums was missing. The Corps removed and disposed of the remaining overpack drum (containing one drum and the rinsate) properly.

2002

February 2002 – The Corps collected additional soil samples at four locations (including where the drums had been found, and approximately 10 feet west, northwest, and southeast of the former drum location). At each location, one sample was collected at the ground surface (0 to .5-foot below ground surface) and shallow subsurface (5 to 5.5-foot below ground surface). These samples were analyzed for PAHs, PCDDs/PCDFs, and pesticides. The only analytes detected above RBCs for residential soil were dieldrin and PCDDs/PCDFs. Surface soil dieldrin detections ranged from 12 ug/kg to 380 µg/kg. The PCDDs/PCDFs concentrations in the surface soil ranged between 1.73 nanograms per kilogram (ng/kg) and 7.2 ng/kg. Neither of these analytes were detected at concentrations above residential RBCs in subsurface soils.

2004

February 2004 – The Corps collected soil samples from 14 locations to delineate the extent of the contamination around the perimeter of the area previously sampled in 2002. Samples were collected at the surface (0 to .5-foot below ground surface) and near subsurface (1 to 2-foot below ground surface) and analyzed for dieldrin and PCDDs/PCDFs. Dieldrin was detected at all 14 surface soil locations but was detected at only two of the subsurface soil sample locations. Five of the dieldrin surface soil results were above the RBC for residential soil. None of the PCDD/PCDF results were above the RBC for residential soil.

2005

March 2004 – The Corps completed the Site Screening Process report and a screening risk assessment (SRA) using the results from the 1998, 1999, 2000, and 2002 sampling events. The final SSP document indicated that a removal action was anticipated for the site. However, the report also recommended the completion of a quantitative risk assessment and additional sampling for dieldrin and PCDD/PCDFs. Upon review of all sampling data, the Project Delivery Team concluded that a Remedial Investigation in accordance with CERCLA , was the most appropriate course of action.

September 2005 – The Human Health and Ecological Risk Assessments were initiated.

2007

April 2007 – The Human Health & Ecological Risk Assessments and Final Remedial Investigation Report were completed.

October 2007 – The Pesticide Drum Area Proposed Plan was completed.

Human Health Risk Assessment

The Corps conducted a four-step process for the human health risk assessment.

1. Identified Chemicals of Potential Concern (COPCs)
The risk assessor compared the chemical concentrations detected at the site to EPA values determined to be protective of human health (EPA Region III RBCs). Chemicals concentrations that exceeded EPA's health-protective values were identified as the COPCs. In this instance, the COPCs for soil under current and future land use scenarios at the Pesticide Drum Area included: PCDDs/PCDFs, arsenic, chromium, dieldrin, iron, and vanadium. No COPCs were identified for exposure to dust and vapors generated by current or future land use activities.

2. Estimated Exposure
The risk assessor considered the different ways that people might be exposed to the COPCs at the site based on current and future land uses, the concentrations that people might be exposed to, and the potential frequency and duration of exposure.

The type of exposure evaluated for the Pesticide Drum area included exposure to chemicals in the surface soil through direct contact and through inhalation of dust and vapors based on current uses of the site by industrial workers, and adult and adolescent trespasser/visitors. In addition, the Corps also evaluated potential future exposures to construction workers, residents, and visitors/trespassers. The conservative exposure assumptions used in this estimate included daily exposure to the chemicals in the soil for 24- 25 years for a resident and industrial worker, intense exposure for one year for a construction worker, and infrequent exposure for an extended period of time for a trespasser/visitor.

3. Calculated Health Effects
For this site, the Corps considered both cancer and non-cancer health hazards related to exposure to the COPCs. The calculated cancer risk is in excess of what an individual's cancer risk would be otherwise due to genetics, lifestyle, etc. Cancer risk is expressed as the probability of an additional cancer risk that would result from the assumed exposure to COPCs. Any cancer risk calculation that is higher than one in 10,000 requires some type of restoration action at the site. EPA's target cancer risk range is one in 10,000 to one in 1,000,000. For this site, the cancer risks ranged between 2 in 100,000 to 9 in 10,000,000) and are much lower than the EPA target/action range.

For non-cancer effects, the risk assessor assumes that there is a threshold intake level for each chemical above which people may experience an adverse effect. For each type of person who may be exposed (ie. adult resident, child resident, etc), the estimated intake of each COPC is compared to this threshold value, resulting in a hazard quotient for that COPC. All the hazard quotients are added and the resulting sum is known as the hazard index (HI). If the HI is 1 or less, non-cancer hazards are not expected. For the Pesticide Drum Area, the conditions at the site are deemed to be protective of people under current and potential future use scenarios.

4. Characterized Site Risk
Based on the results of the previous steps, the Corps determined that the contaminants at the Pesticide Drum Area site do not pose a threat to human health either in its current use or in its potential future use as a residential site.

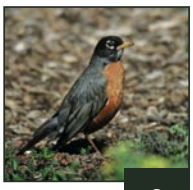
Ecological Risk Assessment

The Corps conducted a screening level ecological risk assessment (SLERA) to evaluate the potential for chemicals at the Pesticide Drum area to affect plants and animals through direct contact with and ingestion of surface soil.

1. Problem Formulation
For this portion of the SLERA, the Corps prepared descriptions of the site, history, environmental setting, contaminant sources, fate and transport of chemicals, potential receptors (plants and animals that could be exposed to the chemicals), and methods of exposure.

2. Analysis
Information gathered during problem formulation was evaluated to estimate potential exposure to various species thought to inhabit the Pesticide Drum area. These species included the American robin, the red-tailed hawk, and the red fox. Based on initial screening efforts, the Corps identified mercury, vanadium, dieldrin, 4,4-dichlorodiphenyltrichloroethane (DDT), endrin, and pentachlorophenol as Chemicals of Potential Ecological Concern (COPECs) based on ingestion by the American robin. Dieldrin was also identified as a COPEC for the red-tailed hawk and the red fox. The initial screening process uses extremely conservative assumptions. Among these assumptions are: 1) the receptor is always exposed to the maximum concentration of each chemical at the site; 2) the receptor's foraging range does not include areas outside the site; and 3) all members of the receptor population are of minimum body weight and forage at the maximum ingestion rate.

3. Risk Characterization
Instead the ecological risk assessor used central tendency body weights and ingestion rates, and considered the size of the Pesticide Drum area relative to the American robin's foraging area. These more realistic assumptions resulted in a conclusion that indicates that chemicals in the soil in the Pesticide Drum area poses minimal threat to wildlife at this site.



Public Comments

The Corps is seeking public comment on their proposed plan of no further action at the Pesticide Drum Area. A 30-day public comment period for this Proposed Plan will begin on January 16, 2008 and end on February 15, 2008. Comments and other information relevant to the Proposed Plan may be submitted in writing to:

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or presented at the public meeting on January 16, 2008 between 6 and 8:15 p.m. at the Courtyard by Marriott located at 8060 Harbour View Boulevard (Suffolk, VA).

Restoration Advisory Board meeting

What's Next?

Following the public comment period, the Corps will prepare a "responsiveness summary" to address significant comments or new data received during the public comment period. The responsiveness summary will be available for public review on the Corps' project website and at the information repository at the Tidewater Community College Portsmouth Campus library. Once a remedy is agreed upon, the Corps will prepare a decision document that will document the plan for the site. Virginia Department of Environmental Quality (VDEQ) is serving as the lead regulator for the Decision Document for this site.

Glossary

Dieldrin – From the 1950's until 1970, dieldrin was widely used as a pesticide for crops like corn and cotton. It was also used for termite-proofing until 1987 when it was banned for all uses.

PCDD/PCDF – polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans – Compounds that are a by-product of some natural sources (such as forest fires) and of emissions associated with incineration and combustion activities (such as the burning of fossil fuels and wood; municipal and medical waste incineration; vehicle exhaust; chlorine-containing materials, pesticide-treated or contaminated wastes, PCBs, and bleached paper).

Additional Information and Reports

The following documents and reports are available for public review at the Information Repository locations listed below:

Gannett Fleming, 1999, *Final Sampling Report for the Commonwealth of Virginia Excess Property ("Triangle" Area), Former Nansemond Ordnance Depot*

HydroGeoLogic, Inc., 2001, *Summary of Activities at the Pesticide Drum Area at the Former Nansemond Ordnance Depot, Suffolk, Virginia*

HydroGeoLogic, Inc., 2004, *Final Site Screening Process Report for Pesticide Drum Area at the Former Nansemond Ordnance Depot, Suffolk, Virginia*

HydroGeologic, Inc., 2007, *Final Remedial Investigation Report for the Pesticide Drum Area at the Former Nansemond Ordnance Depot, Suffolk, Virginia*

MicroPact Engineering, Inc., 2002. *Sampling Trip Report, FNOD.*

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Contact Information

For more information about the Former Nansemond Ordnance Depot project, please contact:

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Project Web Site

http://www.nao.usace.army.mil/fnod

Information Repository

Information about the Former Nansemond Ordnance Depot project is available for public review at the following locations:

Tidewater Community College Library
7000 College Drive, Portsmouth, Virginia 23703
757-822-2124

U.S. Army Corps of Engineers, Norfolk District
803 Front Street, Norfolk, Virginia 23510-1096
757-201-7606